

REMARKS

In the Office Action of October 21 2005, claims 1-15, 24 and 25 were rejected. All pending claims are believed to be patentable in their current form. Reconsideration and allowance of all pending claims are requested.

Rejections Under 35 U.S.C. § 103(a)

Claims 1-12 and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okimura et al. (U.S. Patent No. 5,955,046, hereinafter "Okimura") in view of Park (U.S. Patent No. 6,706,660, hereinafter "Park") and Kepner et al. (U.S. Patent No. 6,342,191, hereinafter "Kepner").

Okimura

Okimura discloses a catalytic system comprising a complex oxide as the main phase. The complex oxide has a **spinel structure** and contains Al, Ga and Zn. As known in literature, metal oxides with spinel structures comprise two metals with a very specific ratio of metal to oxygen. Okimura merely uses Ga oxides as an ingredient for the final product of complex oxides which form the main phase of the catalyst. Therefore the complex oxide of the resulting spinel structure *does not include Ga oxide*.

Moreover, as known in literature spinel structures have a cubic close packed structure with a generic formula of XY_2O_4 , where X is a cation with a +2 charge and Y is a cation with a +3 charge. Due to the special atomic structure, their behavior and properties are different than simple oxides. Therefore the catalytic system described by Okimura is fundamentally different from the catalyst system claimed, and would not and could not function in a similar manner.

The Examiner noted that the claims do not specifically recite that the claimed metal oxides do not have a spinel structure. Applicants contend that the claims need not

include such a recitation to clearly distinguish the invention over the cited art. Indeed, independent claims 1 and 15 recite gallium oxide, indium oxide or a combination of the two. As noted above, Okimura, which forms the basis for the rejection as regards the inclusion of the recited oxides, does not teach the use of such oxides, but rather a complex that no longer can be said to include the basic oxides at all. Claims 1 and 15 therefore need not explicitly exclude complex oxides having spinel structures, as the claims affirmatively include gallium oxide.

Kepner and Park

Kepner describes a catalyst and binder system with a binder and a pendant ligand substituted or unsubstituted adsorbent. The system described by Kepner is fundamentally different from the catalyst system of the present invention. The catalyst system of the present invention does not include either a binder or an adsorbent. Even more fundamentally, Kepner does not teach the use of the oxides recited in the pending independent claims, and the Examiner did not advance that it does.

Park describes a catalyst system including an oxide support material, and a metal promoter or dopant. However Park neither discloses nor suggests use of a hydrocarbon as a reductant comprising at least 4 carbon atoms. The use of hydrocarbon comprising higher carbon content is not suggested by any of the cited references. Here again, Park fails to teach the oxides missing from Okimura and Kepner.

Given the fact that none of the references teaches at least the use of the recited oxides, the combination of Okimura, Kepner and Park cannot suggest or teach the catalyst system of the present claims. Therefore the references cannot support a *prima facie* case of obviousness. Therefore claims 1 and 15 are patentable over the cited references. Claims 2-12 depend directly or indirectly from claim 1 and therefore are similarly patentable.

Claims 13, 14 and 24-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Okimura in view of Park and Kepner as applied to claims 1-12 and 15, and further in view of Balmer-Millar (U.S. Patent Application No. 2003/0118960, hereinafter "Balmer-Miller").

Balmer-Miller describes a NO_x after-treatment system. As described by Balmer-Miller, the reductant used for NO_x reduction are oxygenated hydrocarbons derived from the fuel source. The example of the fuel source is given as gasoline. Gasoline itself is not used as the reductant, but is merely used to derive the oxygenated reductant, which is finally used in the catalyst system to reduce NO_x. Balmer-Miller neither suggests nor discloses use of hydrocarbon comprising at least 4 carbon atoms. As well-known in art, and also defined in paragraph 18 of the present application, hydrocarbons contain only carbon and hydrogen atoms. As known in the art, the reactions of oxygenated hydrocarbons and non-oxygenated hydrocarbon are fundamentally different. The use of gasoline, hydrocarbon containing 8 carbon and other higher hydrocarbons as described in claims 13-14 and 24-25 are neither suggested nor disclosed by Balmer-Miller.

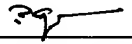
Furthermore, claims 13-14 and 24-25 depend directly from claim 1, which is patentable for at least the reasons set forth above. Therefore claims 13-14 and 24-25 are similarly patentably distinct.

Conclusion

In view of the remarks and amendments set forth above, Applicants respectfully request allowance of the pending claims. If the Examiner believes that a telephonic interview will help speed this application toward issuance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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